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ORIGINAL COMMUNICATIONS.

LIGATURE OF THE COMMON ILIAC ARTERY.

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April 9th, 1863.—Called to visit Col. Scott, 19th Ills. Vols., who was wounded at the battle of Stone River. A musket ball had passed from before backwards through the thigh, entering below the pelvis and at the outside of the femoral artery, grazing the inside of the femur, and coming out of the buttock.

At the time of the accident, there was hœmorrhage, which was controled, as was supposed, by pressure on the femoral artery. The compression was continued about three weeks, during which time no hœmorrhage occurred. The wound suppurated and some small scales of bone came out at each orifice of the wound.

He was removed to his home in Chicago, and did well, although the wound remained open behind, until about the 5th of April, three weeks after the accident, when a small tumor formed in front, which was opened. A day or two after, a hœmorrhage took place from both openings. It was on ac-

count of this that my advice was asked. On the night of the 9th, at 11 o'clock, a copious hœmorrhage renewed, which was controled in a measure, but continued at intervals during the night.

10th.—Saw him at 10 o'clock, and applied the compressor over the femoral artery. This seemed to arrest the bleeding, but in about two hours it returned.

The bleeding had been so great as to threaten death, and I determined to tie the external iliac artery, not doubting from the history of the case that the hœmorrhage was from branches of the profunda femoris close to its origin.

With the aid of Prof. Freer and the Drs. Hurlburt, the ligature was placed upon the external iliac artery in the usual manner, as that described by Lisfranc; but on changing the position of the patient to remove the soiled bed clothing, the bleeding renewed as freely as ever. On a re-examination, the ligature was found to control the external iliac, and it was evident that the ischiatic artery was the one giving blood. The danger was urgent, and I enlarged the wound upward and outward, and placed a ligature on the common iliac artery. The anterior wound in the thigh was then enlarged, and a great quantity of coagula removed from it by the finger. No bleeding; patient under chloroform during the operation. Warm applications to the member; brandy and broth ordered.

11th, A. M.—Limb cool, but not cold; has been troubled with nausea and attempts to vomit, which gave pain in the wound; pulse 100, condition good. Ordered an enema and a solution of Soda Bi. Carb. with Gum Arabic for the vomiting. Broth continued.

12th.—Has considerable pain and tenderness in the region of the left kidney. Pulse 120; slept well during the night, with two doses of Acetum Opii; wounds commencing to suppurate.

13th.—Pulse 100; tenderness in left side diminished; takes broth with wine; slept well.

20th.—Cut of operation suppurates freely. Allowed beef broth and wine, with opiate at night.

24th.—Ligature on the external iliac artery came away.

May 1st.—Ligature on common iliac came away. Patient doing well.

May 12th.—Wound from operation healed.

From this time, he remained in good health until the early part of July, although the wound continued to suppurate and some small pieces of bone were discharged at the posterior orifice.

At this time he was attacked by a copious watery diarrhœa followed by typhoid fever, of which he died July 8th, three months after the operation.

TREATMENT OF PERMANENT STRICTURE OF THE URETHRA BY SUDDEN DILITATION.

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Of all diseases of the urinary organs which fall to the lot of the Surgeon, permanent stricture of the urethra, perhaps, is the most annoying and tedious to the patient and the most troublesome to the medical attendant, and it is for this reason that I feel called upon to bring before the profession of this city a mode of treatment which has been sanctioned and adopted by many of the principal Surgeons of Great Britain, among whom may be mentioned Professor Fergusson of King's College Hospital, London, Mr. Skey of St. Bartholomews, Mr. Cutter, and numerous others of world-wide reputation.

This treatment consists in a forcible and sudden dilitation of the stricture by means of an instrument invented by Mr. Holt of the Westminister Hospital, and with which, in the

space of a few seconds, the largest size catheter may be passed into the bladder without the slightest difficulty.

Strange to say, this treatment has received very little attention in America, and, with the exception of one or two Surgeons in New York—so far as I know—has not been alluded to by any American writer. The instrument itself consists of two portions: first, two solid silver branches of the shape of an ordinary bougie, grooved internally, convex externally, and firmly attached to each other at the point; at the handle is a screw by which they are compressed together to the size of a No. 3 catheter, and between the two is a silver wire which serves as a guide for the straight hollow dilator with which the stricture is burst.

Owing to the size of the instrument it is impossible to use it until the Surgeon has succeeded in passing a No. 3 catheter through the stricture, and then it may be employed in the great majority of cases without the least fear or hesitation. In some cases this treatment has been adopted when only a No. 1 catheter could be passed, but the instrument used has been of smaller dimensions than the ordinary one.

The following, then, is the mode of procedure, after the Surgeon has succeeded in passing a No. 3 catheter: The branches being tightly screwed together, are passed through the stricture into the bladder; they are then unscrewed, and the largest size dilator, No. 10 or 11, is forcibly pushed down through the stricture on the silver guide. The instrument is immediately withdrawn, a No. 10 or 11 catheter passed and the urine drawn off. The patient is directed to take Quinine gr. ij Tinct. Opii. m. x.—three times a day for the first twenty-four hours, for the purpose of preventing any stricture fever coming on, he is also allowed to empty his bladder without the aid of a catheter for the first two days. A No. 11 catheter is again passed on the second and every alternate day for a week or fortnight, when the patient, first being taught, is directed to pass an instrument for himself occasionally.

The *modus operandi* of the instrument has, I think, been

conclusively proved by the following experiment, which Mr. Holt quotes in his work on stricture: A man died in Hospital, I believe, from disease of the chest, and at the time of his death was the subject of a very tight stricture. At the post-mortem examination Mr. Holt introduced the dilator into the bladder, split the stricture, and removed the parts. The fibrine forming the stricture was found to be completely burst open, but the mucous membrane lining the urethra remained quite uninjured. The hœmorrhage after this operation is very trifling; in the majority of cases amounting to half-a-dozen drops, and in very rare instances to a teaspoonful.

The great advantages of this over the ordinary mode of treatment by gradual dilitation are: 1st—The rapidity with which a stricture is cured. 2nd—It is less liable to return after this treat ment. 3rd—Its perfect freedom from danger.

1st—The rapidity with which a stricture is cured. As I have before stated, any ordinary permanent stricture, provided a No. 3 catheter can be passed, may be cured in a fortnight; whereas, by the ordinary method, it very often takes months before a patient can dispense with the doctor. This saving of time is certainly an immense advantage, especially in cases where fistulæ, abscess, irritation or chronic inflammation of the bladder are threatened, or where these complications are already present. For by removing the stricture, these diseases rapidly get well.

2nd—Stricture is less liable to return after this treatment. Stricture, however treated, is liable to return, but it has been proved most satisfactorily that it is less likely to do so after the fibrine has been burst open than when gradually dilated. In the very few cases in which the stricture has returned, it has been clearly traced either to the patient's neglect in not passing the catheter occasionally, or to his taking cold, or a too free indulgence in drink or other excesses. I have seen very many cases, two and three years after they have been operated upon, and they have never had the slightest return of their complaint or experienced any difficulty from it whatever.

3rd—Its perfect freedom from danger. When this treatment was first brought to the notice of the profession, all sorts of imaginary dangers and difficulties arising from it were conjectured. In the first place it was said that the pain of the operation would be too great for most people to put up with. Mr. Holt at first administered chloroform; but after the first few cases the pain of the operation was found to be so very slight that it was discontinued, and now, except in very rare instances, it is never given. The next objection was that it would necessitate the retirement of the patient from his ordinary business for some time; but experience has shown that three or four hours quiet after the operation is all that is necessary.

Some imagined that this apparently rough treatment might produce abscess of the urethra, extravasation of urine, and even death. Mr. Holt has now operated on upwards of two hundred cases, many of which I have watched, when House-Surgeon at the Westminister Hospital. I also operated on upwards of fifty cases, and the only bad symptoms that have ever been noticed have been a few rigors, and these in a very few cases; and in not a *single instance* has abscess or other serious complication arisen.

In conclusion, I would say, after having had a large experience in all kinds of treatment of stricture, that I believe this, in the majority of cases, to be the very best; and I am satisfied that any Surgeon who gives it a fair trial will be very soon convinced of its superiority and will never have cause to regret having used it.

ON THE PATHOGENETIC EFFECTS OF MALARIA.

By W. C. MUNSON, M. D.

Twenty years experience in the practice of medicine, in the Mississippi Valley, has convinced the writer that all diseases induced by malaria, or miasma, have, in common, *one* distin-

guishing characteristic, viz: an abnormal reduction, or depression, of *vital force* or *power*.

In the following remarks the terms malaria, miasmas and mephitic-poison are used synonymously. "The term miasma has been very properly used to signify exhalation." There are certain exhalations from marshes, which have been supposed to cause several varieties of fever, viz: Intermittent, Remittent, Pernicious, etc.; hence the name, "Malarial fevers."

It has never been clear to my mind that all the diseases which have been ascribed to malarial causes have been thus produced. And the question is suggested, may not *other* causes, such as exposure to cold, sudden transitions from cold to heat, damp atmosphere, etc., produce disease which in its symptoms so nearly resemble that caused by *malaria* as to be readily confounded with it? May not our natural proneness to jump at conclusions without sufficient evidence have led us into frequent error on this subject? Because many cases are found to be clearly of miasmatic origin, it has perhaps been taken for granted that all this class of diseases have been produced by the same cause. And the error may the more readily be excused, when we take into consideration the fact that a vast majority of febrile diseases in this country can be clearly traced to mephitic poison. Indeed the clinical experience of most practitioners in the Mississippi Valley has convinced them that a vast majority of the diseases they meet with do thus originate. And doubtless the above pathological error has been the cause of much *seeming* contradiction in the clinical experience of so many learned members of the profession as regards therapeutics. And it is believed that a little more attention to the pathology of these diseases will enable us to distinguish pretty clearly diseases of malarial origin from all others, and thus be able to know the reason why in a few cases—and only a few—of febrile diseases, of the present day, the *antiphlogistic* treatment is imperatively demanded; while, in so many more, it is contra-indicated.

It is readily admitted that this can only be done by noticing carefully the effects of *malarial poison* on the system. All attempts to analyze and classify the peculiar poisonous elements which produce these diseased conditions will, perhaps, fail, as they have done heretofore. They have been supposed to originate from *cryptogamia* of animal or vegetable germs. But this hypothesis appears to lack confirmation. It is true that the concurrence of heat moisture and vegetable decomposition appears necessary to generate miasmatic poison.

The summer of 1854 was a very hot and dry one; so much so that many ponds and marshes were completely dried, exposing surfaces of soil favorable to cryptogamous growths; this was followed by the summer of 1855, so noted as a sickly season throughout the country, and which was hot and wet, favorable to the development and maturity of the above growths. During the rains of the latter part of this summer, and early part of the fall, almost invariably after each rain occurring in the night, a green substance was found covering the ground in the morning. Some of this the writer examined under the microscope, and found it to consist of microscopic vegetation and *sporule*. On placing some of it in cold rain water, which had been previously boiled and filtered, in two days time the water was filled with *monadal infusoria*. Whether such a condition of the atmosphere will produce disease or not, I am not prepared to say. It probably will, however.

Again, on the other hand, the old notion that carbonic acid gas is the poisonous agent, has never been abandoned. And observations in marshy districts, with the present aids of science, seem to corroborate this view. It has been observed for many years that sickly seasons are usually preceded by copious and long-continued spring rains. The marshes, ponds and low grounds are thus filled with water; under water the vegetation undergoes partial decomposition; the *carbon*, meantime, not readily escaping. Consequently its injurious effects are not much felt until, the rains having ceased, the hot sum-

mer's sun evaporates the water and leaves large masses of decayed and decaying vegetation exposed. The exceedingly unpleasant odor so universally observed to arise from marshes, especially after sundown, is thus explained. It is thought that the sensible increase of stench at this time is attributable to the carbon of the partially decomposed vegetation, set free by the rapid evaporation consequent on a hot summer day. It is assisted by the heat of the sun during the day to commingle with the atmosphere as it is set free. But when the heat is withdrawn it remains in excess for a time, until by the law of the commingling of gases it is taken up. It is argued that the peculiar sickening *odor* and sense of oppression felt on inhaling this poison under these circumstances, may be caused by this gas, modified, perhaps, by the circumstances which produce it in excess. Again, it has been observed for many years on our western prairies, that large tracts of recently "broke up prairie" appear to generate malaria. Families have been known to live for years on the "open prairie" with not a case of fever appearing among them during the time; but, an enterprising neighbor comes in and turns up the "sod" of several hundred acres in the immediate vicinity, and now, in the neighborhood of this large "breaking," they are all "down with the chills." And on passing this spot in the evening, after a hot day, much the same disagreable odor and oppressive sensation is experienced as on passing a marsh in the evening. It is believed that the poison so tangibly felt under these circumstances is a peculiar quality of carbonic gas, set free from decomposing vegetable matter, in excess.

The objection, that *carbon*, when inhaled, does not produce the effects known to follow the inhalation of miasmatic poison, is claimed to be of no force, because it has not been and perhaps cannot be shown, that the gas in question, somewhat modified, or perhaps by some catalysis, is not capable of producing all these effects. It appears to be pretty well established that the same exhalations—modified, perhaps, only by the degree of their intensity, or the idiosyncracy of the sub-

ject—produce Intermittent, Remittent, Pernicious, and other fevers.

On close attention to this subject, it will be found that there is at least *one* remarkable coincidence between the effects of malaria on the system and *carbon*, to wit: a *sensible* feeling of depression. A result, it is thought, of a reduction of the vital *force* or *action*.

It may not be of any great practical importance, however, to determine whether the poison in question is gas, infusoria, or something else; but careful clinical observation on the *effects* of the poison, must be regarded as essential.

"Life cannot be considered an abstract entity." The term *forces*, or powers of life, are understood to be used metaphorically. Nevertheless, there is what, for the sake of convenience, we will call *vital action;* which may be explained to be the effect of an unknown agency by which life is sustained, and from which results voluntary and involuntary motion, sensation and reproduction; in short, that which sustains animal life and prevents chemical decomposition of animal organisms. There appears to be three *distinct actions* continually operating in animal beings, viz: the *vital*, already explained; the *chemical*, which is continually producing decomposition, or pulling *down*, as well as reconstruction, or building *up*; and, perhaps, what it may be proper to call *electrical action*.

These actions, as is well understood, are severally and conjointly comprehended by the term, "*Chemical vital*" action, or "*Biochymia*." But it is thought by the writer, that they each operate to perform distinct and important functions; that they are continually operating to sustain animal life, and that each is kept in equilibrium by the action of the other, or, at least, that the *chemical* is controlled or kept in due bounds by the *vital*. For it is observed that when the vital ceases to act, destruction of the organism is the consequence, by *chemical action*. Clinical experience has abundantly shown that "malarial poison" has the effect, directly, to depress, or re-

duce the "vital power or action." How? we may not be able to say. Yet the fact can not be doubted. It may be that, by inhalation, the poison comes in contact with the blood in the lungs, and an organo-chemical change takes place in that vital fluid, so that the material, perhaps, for supplying the waste of organs, is not conveyed to them. The writer inclines to the opinion, however, that the effect is first produced on the cerebro-spinal system; and, by directly reducing the vital power, impedes the entire functions of life. The blood soon becomes impoverished, perhaps, by some chemical action; the liver impaired in its functions, as well as the entire glandular system; and, perhaps, the whole system, even to the ultimate cell structures. The old liver, though slighted, and often too much neglected in these latter days of progress, is still deemed worthy of attention.

Prof. Geo. Hastley, in a paper read before the "Royal Medical and Chirurgical Society," and noticed in the London *Lancet*, says: "The liver is the great laboratory for the manufacture of blood corpuscles in man. Hence the *anæmia* which so speedily follows the suppression or impairment of its functions."

This depressing effect of the poison in question—judging from its effects—impairs the vital action, and, as a consequence, an increased chemical action follows. And as all chemical action, whether in organic or inorganic matter, evolves heat, and more or less electricity, and this electricity, it is believed, comes in aid of the vital power, and prevents serious organo-chemical decomposition. Electrical action is a result of, or is connected with chemical action, in which, during the process of composition and decomposition of the various animal tissues, electricity is developed to be either retained in the system or set free; and which, in many of its actions, bears a close analogy, almost amounting to absolute identity, with vital action; and, perhaps, for which it may act as a substitute sometimes, and thus preserve health and life, where the vital action is impaired. Vital action may be, for all that is

now known, closely allied to electricity, possibly dependent on it. It may be hoped that much that is important in pathology, may yet be learned, by investigating the subject of electricity in its connection with animal life. Health consists in an equilibrium, or correct proportion of these several actions in the system, and when there is a derangement of this equilibrium, a lesion of the living tissues results from an increased chemical action, and disease or death ensues. Chemical action appears always to increase in an inverse ratio to the amount of depression, or sinking of the vital. The phenomena of fever, is believed to illustrate this view. The cold stage, or chill, it is assumed, is the direct effect of depression; and now, as the vital power is depressed, the chemical action preponderates. If not enough to produce perceptible organic lesion; yet always enough to produce functional derangement. And the tissues involved undergo these chemical changes according to the reduction of their vital energy. But this chemical action—as before observed—evolves heat and electricity. And electricity being the best substitute for vital action with which we are acquainted, assists in preserving the system from the more deadly influence of chemical decomposition until its normal functions are restored. It also contributes to augment the temperature of the body, and thus produces—or contributes to—that exacerbation of heat called fever. Perhaps death would result from each chill which precedes fever, was it not for the increased chemical action which, by its accompanying electricity, now comes in aid of the vital powers, and thus prevents farther destruction, until by reaction the vital action is again established.

If the above positions should come to be regarded as established facts, an important step will have been taken in pathological science, and consequently in therapeutics.

This hypothesis, if true, throws much light on certain facts established by clinical experience, but never fully explained. Such as, the unusually rapid dissolution attending the diathesis popularly known as congestive chills. These cases appear

to be suddenly fatal, either from the virulence of the poison, or from the inability of the system to resist it. Consequently, the reduction of the vital power is so sudden and complete, that reaction does not take place; and the lesion caused by chemical action uncontrolled by the vital, results in the speedy death of the patient. And again, in inflammatory fevers of the asthenic type, a superabundance of *fibrine* has been found in the blood. And M. Trousseau, in a recent lecture in Paris, pointed out the striking analogy existing between the more serious symptoms of typhoid fever and those consequent on protracted abstinence, that in both, the blood has an excess of fibrine. It is suggested that fibrine may exist in the blood, not only as material for rebuilding and supplying the waste of organs, but it may also exist as the *debris* of wasting, or impaired organs—*i. e.*, cast off material in process of elimination from the system. Its presence so largely in the blood of animals undergoing starvation, seems to corroborate this view. Hence the anæmia so rapidly following in fevers of this type; and the conclusion is thus strengthened, that in all diseases of malarial origin, whether of intermittent, remittent, or typhoid type, the asthenic condition will be manifest, and that the excess of fibrine in the blood in these conditions is referable to the lesion of the living tissues by chemical metamorphosis, resulting from lack of vital action.

Fever, then, should be regarded, not so much as a disease, as an "effort of nature," to throw off disease. And y t, it is manifestly absurd to call it a "healthy action." Because, unquestionably, the condition is abnormal, and therefore should not be called healthy. If the above be the true pathogeny of malarial diseases, the adaptation of therapeutics to this pathogenetic view, must be regarded as essential. And the truth of the terse, and somewhat eccentric remark of a certain writer, is brought to mind, that "the patient should always be treated instead of the disease."

The clinical experience of so large a number of observing practitioners, both in Europe and America, coinciding in the

rejection of the antiphlogistic treatment in so many cases of inflammatory and pernicious fevers, may be claimed as corroborative of this hypothesis.

The following remarks, made by M. Herard, in a clinical lecture at the "Hotel Dieu," at Paris, bear upon this point, "The treatment of typhoid fever is, of course, different, according to the theory adopted on the nature of the disease. Those who adopt the theory of follicular inflammation of the intestinal tube—an ulcerous affection of Peyer's glands—as the cause of the disease, consistently apply antiphlogistic remedies."

In the opinion, however, that this inflammation, or the decomposition of local secretions, and consequent absorption of poisonous fluids calculated to induce a septic condition, is the proximate cause of this disease, M. Herard does not concur, but believes these local injuries effects, not causes.

He then says, "Hence the local derangements can not be taken as a guide, in the choice of medication most appropriate to a fever, in which the collapse of vital power, and obvious tendency to mortification, points most distinctly to a primary alteration in the composition of the blood."

This author then proceeds, in a brief summary, to give the treatment most appropriate in typhoid, in which he assigns the most important place to food: "Despite the wise precepts of Hippocrates, despite the recent researches which have only confirmed their value, we are still all more or less influenced by the now exploded doctrine of irritation. The terms fever, and food, still appear to imply a contradiction, although it is but too certain, that in typhoid, prolonged abstinence leads to the most disastrous results." He then gives the history of a case of typhoid, of alaxic form, accompanied with delirium, vomiting, and diarrhœa, successfully treated with food alone. He found it almost impossible at first to carry out this plan of treatment. It was with the utmost difficulty that a few drops of beef tea were swallowed. He succeeded, however, by dint of perseverance. And when the food remained on the stom-

ach, and in proportion to its increase, the pulse fell from 145 to 130, 120, 115 and 100, the delirium yielded, and, in short, the patient recovered. Again, he says, "Patients who have received adequate support during the progress of typhoid have been known to pass without any transition from disease to health, and walk in the garden of the hospital on the very first day they left their bed."

The abridgement of convalescence in the cases reported by M. Herard seems to illustrate the foregoing pathological views. The diet treatment, by supporting the vital powers, prevents the lesion which otherwise must have occurred by chemical metamorphosis.

Prof. Flint, of New York, says: "In inflammatory affections, proper discrimination is necessary in the employment of the so called antiphlogistic measures, which, if failing to exert a controlling influence, are always hurtful, and it may be, destructive, by impairing the vital forces. Experience also dictates the judicious use of remedies addressed to the internal causative conditions pertaining to the blood; so far as our present knowledge in these most important provinces of pathology and therapeutics will permit. But this is not all, this diathesis often demands that the vital powers be sustained. Sustaining measures of treatment, practically considered, consist of tonics, alcoholic stimulants, and nutritious diet. We will not inquire as to the *rationale* of the operation of these measures; suffice it to say, clinical experience shows abundantly, that they lessen the degree to which the vital forces would otherwise be impaired by disease, and may prevent a fatal termination of disease by asthenia, or exhaustion." Prof. Flint proceeds in an elaborate and very clear style, to show what important changes have been almost universally adopted within a few years past, in the treatment of many diseases, by discarding depletory measures, and adopting instead, stimulants, tonics, and nutritious diet. In reference to bloodletting, he goes on to say, "Clinical observation, which is alone competent to settle the question, has shown that it is a

remedy not called for so often, nor to so great an extent in acute inflammations, as was supposed but a few years ago." He makes the following remark in reference to blood-letting, and says it will apply to other measures as well: "Blood-letting may not increase the mortality from a disease, nor protract its continuance, and yet prove injurious. The injury may be manifest only in the slowness of convalescence, and the impaired condition of the system after recovery." And here, perhaps, the same explanation will apply as that given above, to M. Herard's case of convalescence abridged by diet treatment. Again, the same author says, "Every sagacious practitioner knows that certain symptoms, no matter with what disease they are associated, denote failure of the vital powers, or inability to resist disease. He estimates the amount of danger by these symptoms, and often bases his prognostics far more on them than on the nature and extent of the local affection. Every practitioner knows that an inflammation, the same in all respects so far as the local affection is concerned, in different persons, affects the vital forces differently.

Take, for example, pneumonia, extending over the same space, and inducing an equal amount of changes which physical explorations enable us to determine with accuracy. One patient manifests but little disturbance of the system, and no symptoms denoting danger, while another will succumb to the disease. It is also well known that some persons while in health, show no lack of vigor, yet have very little ability to resist disease. They are quickly destroyed by affections which other persons readily endure, and endure, perhaps, without much inconvenience. Of course, these facts are explicable, but not with our present knowledge; and until explained, it answers to refer them to differences as regards the vital powers, or forces. They are facts of not a little practical importance." Again, he remarks, "Since physicians have ceased to agree with Southwood Smith, in regarding inflammation as an almost concomitant, and the chief source of danger in fever, the importance of preserving and sustaining

the powers of life has been more and more appreciated; and at the present moment, with the most intelligent practitioners, these are the leading objects of treatment."

Prof. Flint has been quoted thus at length, because of the apparent coincidence between many of his very just conclusions and the writer's pathological views of malarial diseases. And it is hoped that when the subject of chemico-vital action comes to be better understood, as well as the phenomena of electricity in connection with it, much that is now obscure will have been explained.

The important practical lesson designed to be presented in the foregoing remarks, is to give some clear marks, if possible, by which diseases of malarial origin can be distinguished from diseases arising from other causes. And if this attempt should shed any light on the pathology of these diseases, it must in the same ratio contribute to therapeutics, and, consequently, lead to much greater uniformity in the treatment of a class of diseases, by far the most numerous with which we meet.

It is not clear—as above remarked—that some diseases are not ascribed to malaria, which do not belong to it. And on the other hand, unquestionably, error is often committed by overlooking some clear marks which distinguish malarial from other forms of disease. It is true, few would fail to recognize these marks, in cases like that reported some years ago by Dr. Parry, in a thesis read before the Medical Society in Philadelphia—which is said by some writer, to have fallen like a bombshell at the feet of the professors of the Jefferson Medical College—when he quietly asked, "What shall I do with the pulseless, moribund cases of congestive fever, of the Mississippi?" Possibly, *some* might reply yet, as did Prof. Meigs *then:* "The lancet! the lancet! the lancet!"

It affords much pleasure, however, to believe, that a great majority of physicians *now*, understand these cases better.

Yet, it is believed, by keeping in view the foregoing suggestions, on the effects of malaria, error in diagnosis will much more seldom occur. In the limited experience of the writer

—and, no doubt, in that of most practitioners—cases of fever, and even flux, have been met with where, perhaps, the inattentive observer would have pronounced them malarial; but where, in reality, no such characteristic symptoms were manifest. On the contrary, there was strong, full pulse, furred tongue,—not coated—and no marks denoting depression of the vital powers, and which yielded readily to full antiphlogistic treatment, as blood letting, &c.; attended also, with little, or no convalescence.

On the other hand, cases clearly of inflammatory conditions, as Pneumonia, Pleuritis, or Pleuro-Pneumonia, and other forms of the so-called congestive fevers,—where marks of vital depression were clearly discernable,—have shown such wonderful tolerance of stimulants, that even pints of alcoholic spirits were given daily, with no other apparent effect than to lessen the frequency of the pulse, diminish the heat of the skin, and render the mind more clear; and under this treatment readily recover.

It is apparent then, that diagnostic errors in these cases can only be avoided by careful clinical observation of these morbid symptoms, and not by any attempt at classification of these diseases upon any other basis.

CLINICAL LECTURES ON DISEASES OF THE EYE.

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THE CORNEA—ANATOMY AND PATHOLOGY.

Gentlemen: You have already seen a large number of patients with chronic conjunctivitis, in nearly all of whom there were secondary affections of the cornea. That you may understand these secondary affections of the cornea, I shall

call your attention to the structure and diseases of this important portion of the eye, before finishing what I wish to say upon chronic inflammation of the conjunctiva and its treatment. I have stated that the diseases of the conjunctiva claim your first and most careful consideration, as being most common, and primarily the cause of more cases of blindness in the Northwest, than the diseases of any other part of the eye. It is scarcely less important for you to study well the cornea and its diseases, since it is by the destruction of a part or the whole of the cornea that conjunctivitis so often destroys vision.

The cornea is a circular membrane, composed of three principal layers, the middle of which, or the true cornea, is attached at its periphery to the sclerotic. The line of demarcation between the cornea and sclerotic is quite abrupt, but the fact, that the external layers of the sclerotic project slightly over the posterior layers of the cornea gives the appearance of indistinctness to the line of union. The manner in which the crystal of a watch is inserted in its rim is a good illustration of the relative position of the cornea and the sclerotic. The conjunctiva encroaches slightly upon the cornea, especially at its upper and lower portions. This rim—the limbus of the conjunctiva,—is sometimes, even in the young, so broad and opaque above and below, that the cornea presents a very decidedly oval form. The limbus conjunctival is exceedingly liable to become vascular in inflammations of the conjunctiva.

The limbus must not be confounded with the arcus senilis, which is a narrow grey ring running parallel with the periphery of the cornea, but situated within a narrow ring of transparent cornea.

Mr. Canton has written a monograph, showing the relation between a tendency to fatty degeneration and the arcus senilis. This change in the cornea may probably be regarded as normally incident to advanced age—like the presence of grey hairs, falling of the teeth, and presbyopia.

The thickness of the cornea is about half a line, being somewhat more at the periphery than at the centre, in the adult. The degree of convexity in the normal eye is nearly absolutely the same in all its diameters. Occasionally, the convexity is found to be more in one diameter (meridian) than in another, as you will learn, when you study the use of lenses in certain abnormal conditions of the refracting media.

The cornea is a very firm membrane, as is proved in cases of rupture of the globe by simple pressure. The sclerotic almost invariably yields before the cornea.

Although it seem to be a perfectly homogenous, glassy membrane, it is quite complex in its structure, as is shown by the microscope and the action of certain reagents. It is composed of three layers: 1st, the epithelium, which is a continuation of the conjunctiva; 2d, the true cornea, a continuation of the sclerotic, and 3d, the serous membrane, which is in contact with the aqueous humor, and is a continuation of the outer layer of the choroid.

The true cornea is composed of fibrous tissue, resembling, in some respects, the ordinary areola tissue of other organs. In this tissue is found a large number of spindle and star shaped cells, with numerous minute tube like appendices, ramifying in all directions, which last are supposed by some to be connnected with the process of nutrition. There are no true capillaries in the cornea, except at its periphery. The ciliary nerves are traced into the substance of the cornea in the form of delicate transparent nerve tubes.

The epithelium is composed of three layers, each of which is characterized by the peculiar appearances of its cells. The serous layer is composed of a structureless membrane, covered with epithelial cells, in direct contact with which latter is the aqueous humor.

It should be remembered, that in the fœtus, all these elements are quite opaque. As development progresses, they become less and less opaque, till, finally, they are united firmly into a transparent, nearly homogenous membrane.

The cornea is not only the window, as it were, by which light is simply admitted into one of the chambers of the brain; it is also one of the instruments, by means of which perfect images of external objects are formed upon the retina.

The cornea is subject to several very important diseases—nearly all of which are different phases of inflammation. A few words regarding their pathology will enable you to understand the manner in which they prove destructive to vision.

The first visible indications of inflammation in the cornea seem to be confined to the spindle and star shaped cells, and to the deeper cells of the epithelial layer. These cells and their appendices become filled with greyish granules, and much enlarged. They encroach upon the intercellular substance, which is absorbed or transformed into a fatty mass, mingled with pus cells; the tissue is destroyed. If the process is confined to the surface, the cells are cast off, leaving excoriations, or ulcers. If it is limited to the middle layers, abscesses are formed. An abscess, by the rupture of its outer walls, may be transformed into an ulcer.

This process, although it is the same in all cases of inflammation, is exceedingly variable, as regards its extent and rapidity of its course. It may be confined to a very minute superficial spot or spread over an extensive surface, causing a minute or extensive excoriation; if somewhat deep, a deep ulcer will be the result, varying according to the extent and depth of tissue affected.

Sometimes the diseased action will continue for months, without scarcely any change; or it may speedily terminate in the destruction of nearly the whole cornea. It is often difficult to explain these differences in cases in which all the conditions seem alike.

A very common affection of the cornea, and one exceedingly liable to accompany chronic inflammation of conjunctiva and "granulated" lids, is the so-called vascular cornea. Already in the earlier stages of acute conjunctivitis the fine capillaries of the limbus of the conjunctiva are observed to be

enlarged, and filled with blood. The irritation produced by the constant rubbing of the roughened palpebral conjunctiva increases the inflammation. The changes in the spindle and star shaped cells take place as above described; their appendices anastomosing freely with each other, form a network of capillaries. A greyish colored exudation is also found in the superficial layers of the cornea, around these new vessels. This change usually takes place on the upper portion of the cornea, in consequence of the motion of the upper lid. Abrasions of the cornea, produced by burns, scalds, and other injuries, or repeated attacks of phlyctenulae, may also be the cause of the growth of vessels upon the cornea. As the vessels increase in number, and as lymph is deposited around these vessels, the surface of the cornea becomes roughened and red, presenting somewhat the appearance of "granulated" lids. This condition is known by the term Pannus, and may exist over a part or the whole of the cornea.

I have briefly explained the manner in which ulcers and abscesses are formed. Occasionally, the pus of the abscess is discharged through its posterior wall, the anterior wall remaining intact; in this case, the pus is discharged into the anterior chamber, forming what is called Hypopion. If the suppurative inflammative attacks the deeper layers of the cornea, the pus is sometimes diffused between its layers, (usually downwards) till it reaches the inferior line of separation between the cornea and sclerotic. In this case the pus renders the lower part of the cornea opaque, the opacity being convex at its lower border and irregular at its upper edge, and is called onyx, or unguis, from its resemblance to the lunula of the finger (thumb) nail.

The diseased action, as above described, especially the formation of ulcer, is induced by conjunctivitic. The disturbance of the process of nutrition, the pressure of granulations of the lids and particularly the pressure of the œdematous conjunctiva, encroaching upon the edge of the cornea, as it often does in acute conjunctivitis, induce ulceration in this important part of the eye.

But what is the final result of these abnormal changes? The ulcer, whether superficial or deep, may heal; leaving the cornea perfectly transparent. The contents of an abscess may be absorbed and the cornea left in its normal condition. And it is astonishing how speedily an ulcer, an onyx or a Hypopion will sometimes disappear, and how completely the cornea will resume its normal appearance.

But, unfortunately, the termination of these lesions is not always so favorable. The disease may become chronic, causing the patient much suffering and even loss of sight. The new tissue, which takes the place of the abscess or ulcer, instead of being transparent is too often opaque—hence opacities of the cornea. If the opacity is extensive or situated front of the pupil you can readily see how the rays of light are prevented from entering the eye.

Another unfavorable result of ulceration, is perforation of the cornea. The acqueous humor is then evacuated, and the iris and lens thrown forward in contact with the cornea. If the perforating ulcer is very minute and in the centre of the cornea, it may soon heal and the iris and lens be restored to their normal position, since the plastic lymph from the ulcerated cornea is deposited within the space occupied by the pupil without touching the iris and without binding the iris and cornea together. Occasionally in such a case the lymph will be thrown upon the centre of the anterior capsule of the lens, and we there have a small central opacity of the anterior capsule.

But if the perforation is near the peripheny of the cornea, the iris is very liable to form an adhesion with the cornea. Recovery with good vision may result. When the opening is extensive, a portion of the iris almost inevitably protrudes through it. Although vision may sometimes be retained, the inflammation of the iris and cornea is apt to cause softening of their tissues; as the perforation becomes filled with a portion of the iris and lymph, the softened cornea is no longer able to support the pressure outwards of the fluids of the globe and a

projection occurs, called staphyloma. Not unfrequently the whole cornea from the effects of extensive ulceration or chronic inflammation, becomes softened and unable to support the pressure of the contents of the globe. The consequence is a large unsightly tumor, called total staphyloma of the iris and cornea. The walls of the staphyloma may be very thin, or they may be very thick and firm, in consequence of the organization of a large quantity of lymph within or upon the diseased tissues.

Sometimes the cornea, softened by inflammation, is pressed outwards in the form of a cone or of a hemisphere, and may retain its transparency. This condition is called corneal cornea. There is almost an infinite variety of form presented by the diseased cornea.

Before closing, I must repeat what I have before endeavored to impress upon your minds, that it is impossible for you to acquire skill in detecting the commencement of these changes in the cornea, without cultivating the habit of examining carefully the cornea, iris, pupil, and their relative normal position, in a large number of healthy individuals.

SELECTED.

ON THE PRESENCE OF AIR IN THE VEINS AS A CAUSE OF DEATH.

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[Continued from February number.]

To return to the case under consideration. At the autopsy there was found to be slight but general peritonitis. (We have no account of the previous health of the patient.) The uterus contained a fœtus of from four and a half to five months, with membranes intact. No marks of mechanical injury were noticed. The placenta was easily to be broken down, and there were two small clots beneath it. No signs of hemor-

rhage were found in the vagina nor about the clothes nor bed. Dr. Hitchcock, hearing the husband's testimony, formed the opinion that she died from forcible entrance of air into the circulation, through the uterine sinuses. His opinion being made known, the body was disinterred and re-examined five days after death. It was intended to tie all the vessels and open the heart under water; but one of the ligatures slipped off when the vessel was cut, and a puff of air was heard by all present. There was engorgement, probably cadaveric, of the large viscera.

(A careful report of this case, by Dr. Hitchcock, will be laid before the American Medical Association at its next meeting.)

Enough evidence has now been advanced of the liability to the entrance of air into the veins during certain operations in surgery, and under certain conditions of the uterine system, to put every practitioner on his guard against the circumsances which have been shown to be dangerous. Indeed, those most skeptical as to the cases cited admit the prudence of proper precautionary measures. But are there not other occasions, of more or less frequent occurrence, in which the possibility of danger is almost equally manifest as in some of these?

If death has been produced by the mere puncture of the seton needle in the neck, in the hands of a skillful operator, what shall we say of the danger in the operation of tracheotomy, now so frequently practised? Here we meet veins of at least equal calibre with those wounded in certain of the fatal cases, and which the most careful surgeon cannot always avoid. These veins lie on, or within, the borders of the region shown to be the most dangerous, and at the time of such operation are generally turgid with blood. What more is needed than the entrance of the scalpel at a certain angle, combined with traction of the tissues in a certain direction, to open the door to the entrance of the unwelcome visitor? Yet we are instructed by surgeons, if a vein is wounded, to complete the operation as soon as possible, without reference to bleeding, as its completion will at once relieve the loaded vessels and check the hemorrhage; while no word of warning is concerning the possibility of this fatal complication.

Even the simple insertion of a subcutaneous syringe may be conceived to carry with it possible danger. These instruments are liable to take up and eject as much air as water, as we know from experience. The improved syringes of glass show its presence, while those in ordinary use, made of gutta-percha, conceal it.

The dangers to be guarded against in those more rare but very important operations, the transfusion of blood in anæmia, and the injection of water impregnated with salts, in cases of cholera, cannot fail to suggest themselves here. Indeed, there is a statement by the late Dr. Francis, of N. Y., (*Med. Magazine*, Nov. 1832), that in the few autopsies of bodies after venous injection, during the cholera epidemic, great cerebral congestion was found, and air within the heart, aorta, and larger bloodvessels. Allusion was made at the same time to the horrors of death after this operation, but we find no account of symptoms. (See also Experiments on the Transf. of Blood, by Dr. Jas. Blundell, *Medico-Chirurg Trans.*, ix. p. 65.)

We have quoted cases of the introduction of air into the bloodvessels by means of suicidal wounds; but neither Guthrie nor any other of the great authorities in military surgery have noted this as a complication of wounds received on the battle-field. One allusion of this sort we do find. It is stated by Sir Charles Bell (*Practical Essays*, Part I,) that Baron Larrey, while examining with him some sketches of the wounded at the battle of Waterloo, noticed particularly the case of a young man who had been wounded in the lower part of the neck. "Well I know," said this excellent surgeon, "how that young man must have died. I have seen so many wounded during my campaigns, and die from air drawn into the veins." In sabre wounds about the dangerous region we should suppose this accident might be of frequent occurrence; less so in gunshot wounds, where retraction is more likely to close the mouths of the vessels; yet even here it is easy to conceive that in many cases they may remain patulous until closed by coagula. This is a subject which well deserves investigation, and the opportunities offered by the present war to settle it should not be overlooked. The difficulty of making sufficiently careful autopsies near the battle-field, where, if at all, these accidents must take place, is an objection which might be obviated by the detailing of a surgeon for that especial purpose.

We come now to consider certain possibilities more important even than those just recited; more important because they come within the range of every physician's daily practice. We have seen that the injection of gas or liquids into the uterine cavity is attended with danger; yet we have no doubt that both agents are still used for procuring uterine contractions, for the relief of pain, or as disinfectants, without the slightest precaution.

It is not long since Prof. Simpson has discontinued and discouraged the actual injection of carbonic acid gas into the os uteri. (*Edinburgh Med. Journ.*, Sept. 1861, and *American Journ. Med. Sci.*, Jan. 1862, p. 271.) Two instances of sudden death during such injection are reported by Scanzoni. The one of which we have read the particulars (*Brit. and For. Med.-Chir. Rev.*, vol. xxvi, p. 274,) seems to us to point very clearly towards entrance of the gas into the veins as the cause of death.

Mr. James, of the City Lying-in Hospital, London, passes an elastic catheter through the os, between the uterine walls and the membranes, to the extent of four or five inches, and injects cold water by means of an elastic bottle. (Simpson, *loc. cit.*) We can hardly conceive of a more dangerous practice, at least in the hands of those unaccustomed to it, when we remember the ease with which a vein might be punctured and air admitted with the water, to say nothing of the injurious effects of water itself in the circulation. Prof. Simpson himself was greatly alarmed, on one occasion, at seeing a patient faint under the use of Higginson's syringe, an effect which, he suggests, was probably due to some of the fluid (perhaps air) getting into the circulation. Dr. Robt. Barnes (*Obstet. Trans.* 1861, p. 119) states that several cases are known in which death has speedily followed the injection of fluid into the non-pregnant uterus, and says that unless care is taken, air is very apt to be thrown up with the water by any of the ordinary siphons or pumping syringes He refers to a case reported by Dr. Guiller (*Gaz. Méd.*, 1857), in which injections of water being ordered to cleanse the vagina of a woman wearing a pessary, water mingled with air was thrown into the uterus and forced through the Fallopian tubes into the peritoneal cavity, adding that it may be conjectured that air also found its way into the bloodvessels. Dr. H. R. Storer, of Boston, goes still farther and condemns—as we think very justly—the use of Keiler's caoutchouc air pessaries, on the same ground. In an able paper recently read by him before the Suffolk District Medical Society on artificial dilatation of the cervix uteri (*Boston Medical and Surgical Journal*, July 3, 1863), he states that several cases of death from the use of these means have occurred, and names the entrance of air into the vascular system as the most probable explanation of this fatality. Dr. Storer informs us that he has always opposed the use of any of the means by which this class of accidents is rendered possible, and he considers it one of the

chief merits of his method of dilatation, that it places the occurrence of danger from this source out of the question.

If it is urged that accident under such circumstances as we have alleged must be so rare as not to deserve notice, since scarcely any are recorded, we point in answer to the fact that 50 years ago the possibility of accident from this cause under *any* circumstances was not even suspected, while the first instance of the kind, occurring after parturition in the human species, was not noticed until several years after Legallois and Ollivier had suggested its possibility. If we are forewarned of the danger, it may serve not only to bring so light proofs of its reality which would otherwise have slept, but to preserve valuable lives which would otherwise be sacrificed; and it should be remembered that a single accident must weigh more in the affirmative than scores, or even hundreds, of fortunate cases could do in the negative.

Before proceeding to consider the mechanical conditions favoring the accident, and its proximate cause, some mention should be made of a class of cases very analogous to the preceding, viz., those in which gas seems to be developed within the vessels instead of admitted from without. In fact, there appears to be a regular gradation of instances, from such as are evidently wholly physiological to such as are as clearly due to the operation of physical laws; so that the two classes merge into each other, and it is difficult to decide to which some of the cases belong. Thus, the fact of the secretion of gas by mucous lining of the stomach and intestines is too common to require comment. Instances are reported on good authority where the skin and bladder have exhibited the same phenomena. Sir Francis Smith witnessed an instance of this sort, in a hypochondriac patient, where the water of the bath in which he lay became covered with bubbles, which proceeded from the surface of his body. (*Dub. Journ. of Medical Sciences*, 1841, p. 454.) Prof. Puchelt thinks that in certain persons bubbles of air not unfrequently form and explode within the current of the circulation itself, and is familiar with one kind of palpitation, which gives the precise idea of bubbles bursting in the heart. (Jones and Sieveking, *Path. Anat.*, p. 364.) A step further brings us to those cases wherein sudden death has occurred, and where careful dissection, frequently made so early after death as to leave no room for changes of decomposition, has brought to light nothing but the presence of air in the heart and veins to explain the event. Cases of this sort are mentioned by Morgagni (*op cit.*, secs. 20, 24) as

having been remarked by Verdriesius, Grætzius, Ruysch, and himself; and the death of Albrechtus, Prof. of Anatomy at Gottingen, is cited as being of the same kind. Dr. Cless, of Stuttgard, has published 14 cases, in most of which the patients were suffering from blood-poisoning. (G. May, *Trans. of Path. Soc. of London*, vol. ix, p. 154.) Air is said to have been found in the veins, after death from strychnia poisoning, from hydrophobia, and from inhalation of chloroform. (*Id.*) Mr. May reports several cases. In one, the patient being taken ill, the medium vein was opened and much frothy blood escaped; sudden death occurred, and air was found in the heart. In another, there was ulceration of the cæcum, and air was found in the veins, from the ulcer to the heart. A third occurred during the catamenial period, and air was traced from the left lateral ligament of the uterus to the heart. In a case of gangrene of the great toe, air was found from the seat of the lesion to the heart. In a 5th case, the patient recovered from two attacks of sudden cough, followed by insensibility, lividity, coldness of extremities, rapid pulse and respiration, ending with the expectoration of much frothy mucus tinged with blood, and the third attack proving fatal, the autopsy disclosed air in the pulmonary vessels and frothy blood in the cavities and vessels of the heart. In all these cases the autopsy was performed within 30 hours after death, and there was no evidence of decomposition.

It is impossible not to associate this class of cases with that immediately under discussion; and we must admit the possibility of some peculiar and unfrequent condition of the system, which predisposes to the reception of the noxious agent, or to the more rapid development of fatal effects. This of course is mere conjecture, but if we admit its possibility, it will help to explain the supposed rareness of the accident, compared with the frequency of the occasions in which the mechanical conditions favoring it are presented. In those cases where gas is unquestionably developed within the vessels, it would be useful to its exact composition, and thus determine whether it is generated by decomposition of the blood, or merely set free from solution in the fluid. Prof. Bacon informs us that investigations have yet to be made to decide this question, and that the necessary experiments and analyses, though complicated, would be entirely practicable.

If the gas is really set free from solution, it is probably in consequence of some change in the blood, as incompatible with life as actual putrefactive change; for though it is de-

monstrated by the experiments of Bischoff, Magnus, J. Davy, and others, that a large percentage of carbonic acid and oxygen gas both exist in healthy blood (Carpenter's *Prin. Human Physiol.*, p. 1598, and Lehmann's *Physiol. Chemistry*, vol. i, p. 570, and vol. ii, p. 474), yet it is unlikely that either of these could be liberated from solution, and thus cause death mechanically, without some essential change in the vital properties of that fluid which would render it incapable of fulfilling its part in the economy. Yet the mechanical cause may, nevertheless, and probably does, have its share in the fatal issue, and perhaps controls the character of the symptoms.

The mechanical conditions under which air has obtained entrance into the circulation during surgical operations have been pretty thoroughly canvassed. It was shown by Messrs. Barry and Poisseuille that a marked influence was exerted on the current of blood, in certain of the larger veins at the summit of the thorax, by the movements of the chest in respiration, its flow being accelerated during inspiration, and checked, and to a certain degree reversed, during expiration, producing the phenomenon of a venous pulse in that region. This was shown to be due to a sucking action, exerted upon the venous current by the expanding chest. Within this region, the *espace dangereuse* of Amussat, including the lower portion of the internal jugular, the subclavian, and the upper half of the axillary, the opening of a vein was shown to be always followed by the admission of air. It was noticed by M. Bouilland that when the movements of respiration became feeble, the flux and reflux in the veins no longer correspond to the movements of the thorax, but became synchronous with the beat of the heart; and we have noticed this change in the frequency of the venous pulse, in the exposed jugular vein of a cat, before any vessel had been punctured. It corresponds entirely to the circumstances already noticed in connection with the lapping sound produced by the entrance of air at a wound. M. Berard demonstrated by careful dissection, that those portions of veins, subject to flux and reflux, were united to neighboring bones and muscles by aponeurotic laminæ or bridles which kept them expanded, while elsewhere nothing hindered their natural tendency to collapse from atmospheric pressure when not distended by blood. (Velpeau, *op cit.*, p. 453.) Velpeau and others denied the possibility of the accident beyond the range of the venous pulse, but it has been sufficiently demonstrated by various observers, as well as by the experiments of the commission, that many circumstances

may and do operate to extend the area of danger, so as to include smaller veins, as well as those at a greater distance from the heart, and the limits of the danger have not yet been definitely fixed. Any circumstance which prevents the collapse of the vessel under the pressure of the atmosphere invites the entrance of air. Among these conditions are a forced inspiration, during which the platysma, sterno-cleido-mastoid and anterior portion of the trapezoid muscles are lifted off the veins which underlie them, thus allowing them to dilate (Sir C. Bell, *Practical Essays*, p. 17); dragging the forcible distension of a vein during an operation, either by the necessary position of the patient, as in a case of Dr. Warren, or by manipulation of the parts while dissecting, as in the case of Dupuytren and Roux; adhesion of the vein to morbid growths; and thickening of its coats from chronic inflammation. Something depends on the position of the patient, whether erect or recumbent, the former being more favorable to the occurrence of the accident from the comparative emptiness of the veins about the neck, thus placed above the horizontal plane of the heart. The character of the incision into the vein also has an important bearing on the chances of accident. Thus, if a portion of its wall is removed, yet not enough to prevent the onward flow of blood within it towards the heart, air is likely to be drawn with it into the circulation; if the vein is partially divided trasversely at the bottom of a wound, the drawing apart of the flaps may furnish an opening sufficiently large, while complete division transversely would favor immediate collapse and retraction if the veins were not canalized in any of the ways before mentioned. A fact stated by Sir Charles Bell helps to explain the ready entrance of air into a vein through which the current of blood continues to flow. "When water flows through a tube, the tube being gradually larger at its further extremity, and a lesser tube inserted into it, water will not flow from the larger tube into the smaller, but from the smaller into the larger. This corresponds with the course of the blood in the veins; for the lesser veins are inserted into a series of trunks, gradually enlarging in their diameters till they reach the heart. In these circumstances, a hole in the side of the tube will not discharge water, but will admit air." (*Op. cit.*)

The conditions by which air enters by the uterine veins have been less carefully studied. Prof. Simpson says (Reid, *op. cit.*, p. 580), "As to the mechanism of the introduction of air in such cases, I think we can understand it, when we re-

member that the interior of the uterus after delivery, especially opposite the late seat of the placenta, is studded with venous orifices, and that, if air does once become introduced into the uterine cavity, from relaxation of the walls of the organ, it will be liable to be forced into these orifices, and hence into the general venous circulation; providing the uterus, in again contracting, is unable to expel its contents through the os uteri." Dr. McClintock refers to the large size of the veins of the gravel womb, their freedom from inosculation, the total absence of valves, and their termination on the internal surface of the uterus, at the site of the placenta, by large open orifices. "If the uterus," he remarks, "be examined soon after delivery at full term, the majority of these apertures will readily admit a goose-quill, and some will even allow the little finger to penetrate without laceration. During contraction of the uterus, all the openings are hermetically closed; but when it is relaxed, they again become proportionately more or less petulous. From this it is manifest, that the same condition of the organ which causes flooding, is exactly that which is indispensable for the ingress of air; so that the latter, when it does take place, is almost of necessity preceded, or accompanied by hemorrhage. (Churchill's *Midwivery*, p. 529.) This is far too sweeping a statement. It evidently contemplates the possibility of the accident only as a sequence of parturition; yet even here we can readily conceive of the possibility of air obtaining entrance into the uterine veins during the progress of the normal contractions, when little or no blood need escape. Indeed, we must conclude with Simpson, that it is by means of these very contractions that, in many cases, air is driven into the vessels. Facts corroborate this view; for we see by the cases reported, that hemorrhage is by no means a constant accompaniment of the accident, and that where it has occurred, it has apparently been far from profuse. This coincides with the remark of Wattman, and with the experience of the commission, that want of bleeding from the opened vein is a prominent sign of the accident. To the question, How comes the air into the uterine cavity? Dr. Churchill answers: "It may penetrate, doubtless, during the process of expulsion of the child, or during the interval before the expulsion of the placenta, or it may be the result of decomposition. That air is expelled from the uterus occasionally, during or immediately after labor, we know; so that we may conclude with Dr. Cormack: 'I have not only no difficulty in believing, but am constrained to admit, that should

any impediment be offered, in such cases, to the free exit of air by the os uteri, it must be forced into the uterine veins, were their mouths not protected by coagula.'" (*Id.*) M. Amussat thinks that the phenomena of the introduction of air into the uterine veins may be explained by the same mechanism as for the dangerous region, *i. e.*, by the respiratory movements which are transmitted even to the uterus by the flux and reflux of the intestines; and hence if the uterus does not contract, and if the vessels of its walls remain patulous, we can conceive that aspiration of air may take place as at the neck, though doubtless less easily. (*Op Cit.*, p. 245.)

The proximate cause of death has been a subject of much controversy, and it has not yet been explained beyond a doubt. Morgagni states, and appears to accept, the opinion of most of the earlier physiologists, that death occurs from the great distension of the walls of the heart, which was likened to over-distension of the bladder with urine; though he suggests the possibility of apoplexy, in some cases, from the effect of air in the vessels of the brain. (*Op. cit.*, secs. 23, 24.) Bichat also believes that the air becomes mortal on arriving at the brain, but how it operates upon this organ to produce death, he considers not worth investigating. "*Qu'importe le comment?*" he asks, "*le fait seul nous interesse.*" (*Op. cit.*) Nysten reasserted the opinion of the earlier experimenters, that death, in the rapidly fatal cases, was due to over-distension of the right cavities of the heart, which he believed occasioned such a dragging of the fibres of the left ventricle as to oppose the free exercise of its contractility; though, in those cases where the fatal issue was delayed, he acknowledged that its cause was in the lungs. (*Op. cit.*, p. 166.) Magendie, Dupuytren, and others accepted this view. (MERCIER, *Gaz. Méd.*, 1837, p. 485.) MM. Piedagnel and Leroy thought that the air forced into the lungs by the contractions of the right ventricle, and suddenly expanded by the change of temperature, ruptured the pulmonary capillaries, and produced emphysema, and thus stoppage of the circulation. (MERCIER, *op. cit.*, 1837, p. 484.) M. Ollivier accepted this theory as probable in the more prolonged cases, but preferred that of Nysten for the instances where death was sudden, suggesting the probable rarefaction of air in the heart as the occasion of over-distension. (*Op. cit.*, p. 71.) M. Amussat seems to have held a similar opinion. (*Op. cit.*, p. 240.) M. Marechal de Calvi thought that carbonic acid was disengaged from the

blood by the oxygen of the air mixed with it, and that this operated as a poison upon the heart. (ERICHSEN, *op. cit.*, p. 4.)

M. Mercier names, 1st, stasis of the venous blood, from the inability of the heart to propel so elastic a fluid as air; 2d, interruption of the arterial circulation from the same cause, combined with the frothiness of the blood in the pulmonary capillaries; while, 3dly, the pressure of air in the arterial system may give the last blow to the organs already enfeebled by the privation of their natural excitant. (*Gaz. Méd.*, p. 485, 1837.)

M. Denot assigns as the cause, accumulation of air in the right cavities of the heart, consequent upon inability of the auriculo-ventricular valve to prevent the reflux of air from the ventricle into the auricle. (*Id.*, p. 728.) Sir Charles Bell believes that air interferes with the functions of animal life, by entering the vessels of the medulla oblongata. (*Op. cit.*) Dr. Wing asks: "Can we not suppose that the air impairs the power of circulation, 1st, by distending the heart with its own volume; and, 2dly, by causing an imperfect closure of the valves, and thus permitting a reflux of blood at each contraction of the ventricle, which causes, in its turn, an increased disturbance, until it goes beyond the power of reaction to overcome." (*Loc. cit.*)

Professor Wattman's theory is, progressive decrease in the activity of the heart, and of its influence upon the circulation, in consequence of the sudden over-distension of the venous system by the mixture of blood and air; the insufficient oxidation and decarbonization of the blood in the lungs, with simultaneous and equal decrease in, and impediment to, its electro-magnetic influence; the diminution of the exciting and nutritive qualities of the blood, and its consequent diminished capacity to maintain the function of those parts of the brain, spinal marrow, lungs, and heart, the united action of which are essential to life. (*Am. Jour. Med. Sci.*, vol. 9, N. S., p. 170.)

M. Bouillaud assigns a threefold cause. 1st. Distension of the right cavities of the heart, impeding its contractions. 2d. Spumous blood in the branches of the pulmonary artery preventing the free passage of blood through the lungs. 3d. Entrance of air into the vessels of the brain causing compression of that organ. (*Op. cit.*) Dr. Cormack attaches importance only to the first of these reasons, Reid to the first and second conjoined, while others, among whom are Poisseuille (*Gaz. Méd.*, 1837, p. 671), Erichsen (*op. cit.*, p. 15), Bernard (*Des*

Substances Toxiques et Médicamenteuses, p. 163), and Dalton (*op. cit.*, p. 510), are content with the second of these alone.

We have thus gone over with the principal theories offered to account for the fatality attending the accident. Our limits will not permit us to discuss them, though there is not one which does not seem open to objections more or less weighty. Those referring death to the presence of air in the brain or spinal cord, or to emphysema of the lungs, are disproved by the result of dissection in a large majority of cases.

Against the theory of poisoning from the elimination of carbonic acid, are adduced the experiments of Nysten, which show that the injection of that gas is even less injurious than air, being more readily soluble. (*Op. cit.*, p. 81.) Against the theories indicating obstruction at the heart, it is urged that that organ is often seen contracting after the respiration has ceased, and that it is by no means always found distended. (*Erichsen*, p. 10.) Finally, it is objected against the theory of obstruction of the lungs by frothy blood, that the sudden injection of an equal volume of water produced the same effect as air. (*Br. and For. Med. Rev.*, vol. xxv., p. 462.) While we believe that the disturbances produced in the economy by the presence of the foreign element are as complex as are the relations of interdependence between the different organs and functions of the body, and cannot be satisfactorily explained in the present imperfect state of our knowledge of these relations, we admit that the weight of evidence indicates that one of the chief troubles is the impediment offered to the passage of blood through the lungs. It should be remarked, however, that the symptoms produced may be all referred to disordered nerve influence, so that whatever mechanical conditions combine to strike the blow, or on whatever link or series of links of the vital chain it falls first or chiefest, it must be felt by the cerebral centres before any response becomes manifest.

We are now prepared to give an opinion on the practical question referred to at the beginning, viz., as to the nature and amount of evidence necessary to prove that a given case of death was due to this cause; and we reply, in general terms, that a sudden death taking place under any of the circumstances shown to be favorable to the occurrence of this accident, and not adequately and satisfactorily accounted for in any other way, affords strong presumptive evidence in favor of this as the cause; that if in addition the case presents certain of the prominent symptoms which we have remarked,

such as violent disturbance of the respiratory and cardiac movements, great prostration, or convulsive spasms, and especially if the hissing sound indicating the entrance of air, or the churning sound, significant of its presence in the heart, is heard at the same time, the fact may be considered as established without the additional evidence of a *post mortem* examination, which should nevertheless be always obtained, if possible, that the proof may be rendered unexceptionable, as well as for the scientific interest attaching to it. At the same time we cannot too strongly urge the importance of accurately noting the minutest details, as far as this can be done, without sparing every possible effort for the relief of the distressing symptoms. Above all, auscultation of the heart should never be omitted. In conducting an autopsy in a suspected case, the length of time which had elapsed since death should be noticed, together with the temperature, whether warm or cold, both of the body itself and of the atmosphere in which it had been kept, and the general condition of the body as to cadaveric changes. The calvarium should not be removed until after the heart is examined, and great care should be taken in opening the thorax not to wound any considerable vein. As a precaution against this, it would be better to saw the sternum through, than to disarticulate it from the clavicle. The contents of the heart, and of such of the larger vessels as give evidence of the presence of air, should be evacuated under water, notice being taken whether the air, if any issues, comes to the surface in a single wave, or in a multitude of minute bubbles. The former would indicate that the air was present, unmixed with blood; the latter that it was mixed with that fluid, forming a froth. We should not, however, with Prof. Dalton (*op. cit.*, p. 517), make this a decisive diagnostic sign, indicating whether the air gained entrance during life or not, unless the autopsy took place immediately after death, which, of course, it seldom can; for a short time might suffice for the froth to subside, and the air to be extricated entirely from the blood, which was doubtless mixed with it by the action of the heart. The gas might be readily collected in an inverted beaker, and measured approximately, and in a case admitting of doubt as to whether the gas was atmospheric air or not, the rough analysis resorted to by Roux would suffice. After collecting the gas, he decided that it was not ammonia because it was insoluble in water; it was not carbonic acid, for it gave no precipitate with lime-water; a lighted bougie plunged in it burned with the same activity as in the sur-

rounding air, hence it was not nitrogen; neither was it oxygen, which would have given increased brilliancy to the flame, while hydrogen would have taken fire itself while extinguishing the taper. Thus, by the process of elimination he arrived at the conclusion that the gas found in the heart was atmospheric air. (MERCIER, *op. cit.*, p. 483.)

We now pass to a brief consideration of the remedial and preventive measures. As to the former the indications are—1st. To prevent further ingress of air. 2d. To remove from the heart and lungs, if possible, that already admitted. 3d. To sustain the vital organs in the performance of their functions.

The first indication can be promptly met in surgical cases; indeed Wattman places almost his whole reliance on the prompt application of the necessary measures for this end, asserting that, if attended to when the first signs of the accident are manifest, a fatal termination can always be avoided. When the lapping sound is heard, or any symptom pointing to the entrance of air is noticed, instantly desist from the operation and press the point of the index finger upon the spot whence the sound proceeds. Finish the operation without removing the finger. If the hand is in the way, let the finger of another hand be placed upon the vein between the wound and the heart, until the first finger is slid along the vein to the necessary distance. As soon as possible, permanent closure is to be obtained either by quickly uniting the lips of the wound, by ligature on the vein, by torsion, or by the lateral ligature, whichever of these methods seems most practicable, from the nature of the incision, the relation of the vessel to the surrounding parts, and its size and importance. The lateral ligature is claimed by Wattman as peculiar to himself, and we must refer the reader to his work, or the reviews already quoted for an account of it. Its application is to large veins wounded through only a portion of their diameter, and it is intended to close the orifice without obliterating the calibre of the vessel. Ferguson thinks there would be danger of exciting inflammation in the vein by this method, and that simple closure of the wound with a little pressure would be preferable. (FERGUSON'S *Surgery*, p. 630.) The prompt application of compression, has apparently been the means of saving life in many of the cases reported, among others in one of those of Dr. Warren, and in the late one of Dr. Clark; but, of course it is inapplicable to cases where the uterus is the source of the accident, and it must be confessed that little can be done in

those cases under the first indication. If a clot or other obstruction exist in the cervix uteri or vagina, it should be speedily removed.

Under the second indication, the most important measure is probably artificial respiration, which, by keeping up the action of the heart, may lead to the propulsion of the spumous blood through the pulmonary capillaries. Amussat and Blandin recommend suction by means of a tube passed through the wounded vein, or the right jugular, into the auricle, combining this with pressure on the chest. Magendie and Rouchoux advise suction alone, and Gerdy, simple compression. The objections to suction are the danger of admitting more air, and of injuring the inner walls of the vessels or heart, and we do not know that it has ever been practiced. M. Amussat ascribed recovery in the case already mentioned reported by him, to pressure which he employed upon the chest, at the same time leaving the opening free. The patient should be so placed that the opening in the vessel shall be directed upwards, and be on a somewhat higher level than the heart. The pressure should be made to alternate with relaxation, and care should be taken during the intervals to close the orifice of the vein.

To meet the third indication artificial respiration is also required, together with the administration of brandy and diffusible stimulants. Various other measures of more or less value have been recommended; among these the recumbent position and pressure on the abdominal aorta or iliac arteries, both of which means promote the afflux of arterial blood to the brain, and thus help to sustain it in the exercise of its functions. If there are signs of great venous congestion, bleeding at the right jugular vein, care being still taken to avoid the further entrance of air, may at once relieve the brain and the right side of the heart of excess of venous blood. For the rest, the usual remedies applied in ordinary syncope should be invoked, such as aspersion with cold water, the application of ammonia to the nostrils, and warmth to the extremities. Dr. Cormack recommends the alternate use of hot and cold douches combined with stimulants, in those cases which threaten asphyxia. "In many instances," he says, "repose, dashing cold water in the face, keeping the surface warm, and time may be the only means which ought to be used." (Churchill, *op. cit.*, p. 531.) If the immediate danger is averted, care is to be taken against the supervention of inflammation in the lungs.

The preventive measures consist simply in avoiding as far as possible all the known conditions which favor its occurrence.

In most of the cases the means of avoidance suggest themselves at once in connection with the danger. A few measures require particular mention. Erichsen recommends with Gerdy enveloping the chest in tight flannel bandages to prevent the deep, gasping inspirations which favor the ingress of air. This has been objected to on the ground that respiration would be too much interfered with, while the admission of air would not be prevented; but aside from this, the now universal use of anæsthetics during surgical operations renders the respiration sufficiently regular by controlling the emotional influences which would otherwise disturb it. On the other hand compression of the hypogastrium after delivery, by means of a bandage around the abdomen, as advised by M. Amussat (*op. cit.*, p. 245), seems a judicious prophylactic measure. He also recommends that the thighs be kept approximated. M. Dupuytren counselled that, in the removal of tumors in the dangerous region, they should be divided into several portions by crucial incisions, and thus removed piecemeal, to avoid the traction necessary in dissecting them whole from the adjacent tissues, and M. Graedemur has taken a similar precaution since the occurrence of the accident under his hands. (*Am. Journ. Med. Sci.*, July, 1842.) M. Blandin also advocates this plan of crucial incisions, and in addition, in view of the fact that the accident seems to be more uniformly fatal when occurring towards the close of an operation wherein considerable blood has been lost, proposes that the extirpation of tumors be commenced at the part most exposed to the access of air, instead of leaving that until the last, as is usual. (*Gaz. Médicale*, 1843, p. 51.) Compression of the large veins between the seat of operation and the heart has been recommended, but would often be objectionable from causing turgidity of the vessels. For the rest, a full knowledge of the conditions favoring the entrance of air into the veins, and the keeping that knowledge in mind during all operations and in the care of all cases in which there is a possibility of danger; these are the best safeguards against it.

In the imperfect sketch which we have now given of this important subject, we have endeavored to give especial prominence to its practical aspect. We have not taken up single cases and analyzed the evidence for and against each; having neither space nor disposition to do this, but preferring to admit at the outset, that every case cited, while it adds something of value to the whole mass of evidence, is of itself imperfect; but we have presented an array of facts and authorities which

taken as a whole, must, we think, convince any candid mind that fatal accidents have occurred, and may again occur, in all of the ways which those cases illustrate. By giving a *résumé* of the cases already known, with an account of the conditions under which they occurred, by indicating other circumstances under which there is more or less reason to apprehend danger, and by citing instances of an analogous class of cases which it is practically desirable to distinguish from these, we have hoped to aid the practitioner to deal intelligently with any case of the kind which he may have the misfortune to encounter, and therefore have been content to pass over very briefly the medico-legal and therapeutic aspects of the subject. In conclusion, we commend the matter to the attention of the practical men of the medical profession, whatever their specialty, feeling confident that it is well worth the trouble of further investigation,

EDITORIAL CORRESPONDENCE.

WASHINGTON, Feb. 16, 1864.

Notwithstanding this city is so well known, some things relative to it may not be devoid of interest to the readers of the JOURNAL. In general terms, I must say, I am much and unpleasantly disappointed in it. Its site has nothing to recommend it. It stands in a basin, surrounded by hills of slight elevation. It is reached only at great inconvenience, and has no business or commercial importance. It can be defended from a foreign or domestic foe only at great expense and effort, and it seems to me that when the war is over, and we are a united and peaceful people once more, the question will force itself on the public mind—where is the proper place for the capital of the nation? The public buildings—erected at great cost—are scattered over the city in such a way as to detract much from their influence on the mind, and the private edifices are very poor, and form with these, an unpleasant contrast.

There are some objects of interest here, among which is the Smithsonion Institute, founded by a munificent bequest made to our government by an Englishman,—James Smithson,—his avowed object being the dissemination of knowledge among men. In making this disposition of his wealth, he exhibited much of true wisdom, and placed his name where it will become more and more conspicuous, as those of the great body of his cotemporaries that now surround him shall one after another fall into oblivion. It is especially designed to give opportunities for scientific investigation, and what it has accomplished in this way under the supervision of Prof. Henry is well known to the public. It has an extensive library—its museum contains an interesting collection of prepared birds and animals—of shells and geological specimens—and also curiosities of different savage tribes, that illustrate strikingly the stages of their progress in civilization. It has, too, some works of art—a collection of Indian portraits, and 'tis to be hoped this may soon be the only reminder we have left of this worthless race. There are some heads in plaster—Cuvier's the only noticeable one—it is grand—the finest configuration I ever looked upon. There are a number, not yet dead, who will only live in clay, who have taken the precaution to place their names on the pedestals, that there may be no mistake. There is a pedestal for Pierce, but the bust is gone—translated, no doubt. I have long thought he stood in danger of this accident. The Washington monument is a sad affair. At a distance it reminds me of a kiln for the manufacture of pottery. It is unfinished, and is likely to remain so—for though contributions continue to be taken for it, it is not supposed they much more than cover incidental expenses. I should not think the view from it would ever be pleasant, and with its present surroundings, it is dismal enough. It is now in the midst of a great cattle yard, and around its base I saw one or two hundred government cattle—ordained victims for the shambles, and near it are racks for feeding, sheds for sheltering the hay, a long low building filled with quarters of beef,

and standing around it army wagons to convey it as needed to the camps. In a building resembling this, I found the stones sent by different nations, States, and associations, to be inserted in the monument. The inscriptions on some interested me. For example: "The State of Louisiana, ever faithful to the Constitution and Union," Let us hope this may soon not be inappropriate. Another seceding State has adopted the language of Jackson: "The Federal Union, it must be preserved." The American Medical Association has a contribution, with a design suggested by Davids' painting representing Hippocrates spurning the gold offered by Xerxes, if he would desert his own people and engage in the service of the king. The design is rendered peculiarly happy from the contempt in which the profession has always been known to hold money. In the figure, the hand with which he was motioning them back has been broken off—doubtless by some faithless wretch, who feared that professional virtue might not be always proof against the temptation, and that the treasure might be grasped.

There is nothing in Washington so interesting to the physician as the collection instituted by the Surgeon General—Dr. Hammond—designed to illustrate the medical and surgical history of the rebellion. At the last session, Congress appropriated $5,000 in aid of the undertaking, and double this sum is asked of the present, and I doubt not there is enough of enlightened wisdom in this body to secure the money. So far as I know, it is the first instance in which the general government has done anything to aid the profession, to which, especially in the present war, it is so much indebted. The museum contains about 5,000 preparations, both wet and dry. The osteological specimens show every conceivable injury liable to occur from the accidents of war, and passing through all the stages from recent injury to long protracted efforts at repair. They are beautifully mounted, and the collection is said, by those of extensive foreign travel, to be, in regard to recent injuries, superior to any in the world. The

proportion of specimens where union has taken place is small, for such patients have recovered without amputation, and cannot yet spare their limbs for exhibition. The wet preparations include many beautiful specimens of intestinal disease, so common in the army—showing every stage and grade of ulceration, perforation, enlarged follicles, &c.,—also, scorbutic ulcers of the mouth and throat, extensive diphtheritic membranes, hospital gangrene, and other objects of interest that I cannot enumerate. Excellent drawings of pathological conditions are being executed in water colors, designed to furnish the plates for the medical and surgical history of the war, that the Surgeon General intends to publish. A large number of microscopic preparations, both pathological and physiological, are already made, and are every day being increased.

Previous to this time, we have always looked abroad for exhibitions of the highest perfection in this art—but already, the skill which is the fruit of constant practice has enabled us to equal the best efforts of the old world. There is also a laboratory in which the purity of samples of medicines furnished to the government are tested, and in the medical department we have to give thanks that the days of "shoddy" are past.

A series of observations are now being instituted, with a view of finding out, if possible, the occult causes, atmospheric or otherwise, which tend to the propagation of diseases most common in hospitals. This work is being carried on under the supervision of the Surgeon General, by Drs. Brinton and Woodward, and it could hardly be placed in better hands. They possess the requisite attainments, and pursue their labors with the ardor inspired by the love of scientific investigation. It is to be hoped nothing may interrupt their work, and that from their labors we may preserve something to medicine and surgery of the rich experience of the war.

I think the profession, and the army are under obligation to Dr. Hammond for what he has done as Surgeon General. His position has been one of exceeding difficulty. No man in this

place could avoid giving offence to many—and especially would this be true, if he performed the duties of his station well. All who find themselves thwarted in their designs on the public, will curse the obstacle that stands in their way, and he who disturbs traditionary usages, however unreasonable, will surely be anathematized, and I suspect that when Gabriel summons the elect to the fruition promised as the reward of their virtues, the half of them will lose their temper at his disturbance of their slumbers.

Our peace establishment for the medical department hardly furnished a nucleus for what is demanded by this gigantic war. The Surgeon-General had everything to organize and supply, and the sanitary condition of the army attests how well he has performed this task. I think him particularly well fitted for his place at the head of the Medical Bureau. His scientific acquirements and practical professional ability are well known, but he superadds to these executive capacity, pride in the profession, a jealous watchfulness over its honor and interests, and an enterprise and activity in carrying out his designs, quite shocking to dull and slow routinists. His lack of subserviency to non-professional men, who so often think they know better than the members of the profession about medical matters, has given offence to some. The attacks on him have been pressed with vigor, and long continued, and his position has been made as unpleasant as possible, perhaps with the hope that he might be thus made to resign. I have long thought there was a systematic attempt being made to prejudice him in the public mind, by the use of the telegraph, and in this way during the last four months, we have had him, over and over again, court-martialed, suspended from duty, or dismissed from the service. For some cause he finds in the Secretary of War a very bitter enemy, who treated him in such a manner as to compel Dr. Hammond to ask a court-martial to inquire into his official conduct, which favor was obtained only after more than one request, and not until the appeal had been made to the well-known sentiments of justice of the President himself. No efforts will be spared

by Mr. Stanton to be rid of Dr. Hammond. The court is now in session in this city, is composed of nine members, and is presided over by Maj. Gen. Oglesby of Ill. He is the only one of whom I have much knowledge, but the people of Illinois know that he is beyond the reach of political or personal influences, and would do intentional injustice to no man.

I designed my letter to be brief, but fear it has grown to an unpardonable length. E. I——.

☞ We owe an apology to many friends for not returning receipts promptly for money received on subscriptions. The delay has been unavoidable, but we hope to correct it with the April issue.

BOOK NOTICES AND REVIEWS.

The Nervous and Vascular Connection between the Mother and Fœtus in Utero. By John O'Reilly, M. D., F. R. C. S., I. New York: Printed by Robert Craighead, 1864.

From believing that the ever varying mental conditions of the Mother, exercise a direct and controlling influence upon the nutrition and development of the Fœtus in Utero, and thus affording an explanation of the presence of "Marks" upon the surface, and abnormal developments of the various parts of the body of the Child, so frequently seen, the Profession passed to the other extreme, and held that these occurrences were accidental and entirely inexplicable. Now again the Physiologist is directing the Medical mind back, and by the advance in Anatomical and Physiological knowledge of the present day, endeavors to furnish the rationale of the occasion of these irregularities. Speaking of the influence of the maternal imagination in causing deformities and marks in the Fœtus, Dunglison says, "As a cause, therefore, the influence of the maternal imagination has been generally regarded as an inadmissible hypothesis. By many it has been esteemed ridiculous." *Phys.*, 2*d Ed.*, 1836. A late and popular work expresses the opposite opinion in the following language: "There is now little room for doubt that various deformities

and deficiencies of the Fœtus, conformably with the popular belief, do really originate in certain cases from nervous impressions, such as disgust, fear, or anger, experienced by the Mother." *Dalton's Physiology.*

This pendulum movement of the Medical mind upon this subject, the author endeavors to bring to an equipoise, in the morceau before us, the latest addition to the literature upon the topic—the perusal of which has afforded us much pleasure. The subject is treated somewhat in the following order:—1st. That motion and pain are connected with the presence of nerves. 2d. That impressions made upon the cerebro-spinal system, are communicated and extend to the organic nervous system, through the inosculation of the nerves of the former with those of the latter. 3d. The following question is proposed, Is there a nervous connection between the Mother and Fœtus in Utero?

"It is a question, too, which has baffled the greatest Anatomists and Physiologists of the past and present generation to solve. Evidence of the truth of a connexion existing between the mother and fœtus in utero is continually presented, and, although the *vox populi* affirms the truth of such a connexion, judging from facts and the evidence of the senses, yet, strange to say, the medical profession has failed to give a satisfactory account of the phenomena presented in it, and ignores as well as repudiates the idea of there being any nervous connexion between the mother and fœtus in utero.

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Mr. Quain says: "Now, as to the *sympathetic* nerve, so far from being in any way derived from the brain or spinal cord, it is produced independently of either, and *exists* notwithstanding the *absence of both.* It is found perfectly *formed* in *acephalous* infants, therefore *does not arise,* mediately or immediately, from the *brain;* neither can it be said to *receive roots* from the *spinal cord,* for it is known to exist *as early* in the fœtal state as *the cord* itself, and be fully *developed* even though the latter is *altogether* wanting. It appears that whilst the organs of vegetation and life are being formed, the sympathetic nerves are *produced concurrently* with them; and that as the growth of these proceeds from the *circumference* to the centre of the whole body, from its lateral parts to the median line, the *sympathetic nerves* also *conform* to the general law."—See Quain's *Elements of Anatomy,* p. 711.

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Mr. Harrison, the celebrated anatomist, says, in speaking of the organic nerves which surround the aorta, "the latter accompany the common iliac artery to their division, and several filaments are prolonged around the internal and external iliac vessels."

These organic nerves are prolonged from the internal iliac artery along the umbilical arteries to the placenta, there inosculates with the corresponding class of nerves, which surround the uterine arteries.

4th. That there is a *direct* vascular connection between the mother and fœtus is *inferred*, from the *assumed* analogy between the placenta and liver—each organ having four sets of vessels appropriated to corresponding offices.

The circulation in these several vessels of the placenta, during gestation is manifestly powerfully affected by various states of the mind, by accident, etc. Proof—Hearing unexpected intelligence of an exciting character, produces abortion.

"Here the impression is conveyed from the filaments of the auditory nerve to the brain, spinal cord, sacral ganglia, connected with the roots of the spinal nerves, the hypogastric plexus, the nerves surrounding the arteries, distributed to the uterus, causing contraction of the muscular fibres of this organ and followed by the expulsion of the *ovum*."

Various circumstances may impress the nervous centres of the mother, be transmitted to the fœtus, occasion irregularity in the circulation of a part and defective nutrition, and thus produce nevi and deformities. The author's views are clearly stated—his arguments, if not demonstrative, are at least ingenious, his conclusions logical—and will well repay the time devoted to their study. Many cases are collated to illustrate the positions taken—none of which are more remarkable than an instance occurring in the practice of Prof. Miller, of Rush Medical College:

Mrs. W., in her third pregnancy, while passing to different parts of the city in following her vocation, ladies hair dressing, frequently met an individual in the streets, who was considerably deformed, and was severely affected with Chorea. The

sight of this individual, with his fantastic and purposeless movements, his idiotic countenance, and distortion of body, produced a strong and repulsive impression upon her mind, so that she frequently expressed the fear that the effect would be unfavorable to the perfect development of her child. During the *progress of the labor* she manifested her anxiety upon this point. The labor, which took place March 26, 1863, was natural. The child, a female of the ordinary size, lived for a few minutes, and presented the following peculiarities:

On the back part of the head was a tumor the size of a large orange. It had hare-lip and cleft palate. The inferior extremities were of unequal length; both feet turned inwards (talipes varus); on each foot were six toes; on each hand five *fingers*. The specimen is preserved in the Museum of Rush Medical College.

St. Louis Medical and Surgical Journal.—Bi-Monthly. Edited by Profs. M. L. Linton, M. D., and F. W. White, A. M., M. D. New Series, Vol. 1., No. 1. Terms, $3,00 per annum.

After an absence of three years this valuable Medical Journal has again made its appearance on our table, looking as bright and neat as it was wont to do of yore. And its pages are so well filled with valuable matter that it will lose nothing by a comparison with its former self, or any other Journal in the country.

We congratulate the Editors on the favorable auspices under which they renew their editorial labors, and cordially welcome the *St. Louis Med. and Surg. Journal* to our exchange list.

Notices Deferred.—From want of space in the present number we are compelled to defer till our next issue, suitable notices of the following works:

On Asthma, Its Pathology and Treatment. By Henry Hyde Salter, M. D., F R. S., Fellow of the Royal College of Physicians, Assistant Physician to Charing Cross Hospital, and Lecturer on Physiology and Pathology at the Charing Cross Hospital Medical School. Philadelphia: Blanchard & Lea. 1864.

Parish's Practical Pharmacy. 3d Edition. By the same Publishers.

Ellis' Medical Formulary. New Edition.

Dalton's Treatise on Human Physiology. 3d Edition. By the same Publishers.